Holography

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Abstract:

Holography is the technique of forming 3 dimensional images by use of lasers, based on the phenomenon of interference and diffraction of light. The British Physicist Dennis Gabor first invented holographic method in year 1971. From then until now many scientist and theoretical physicists have introduced many holography methods each one proving better then the other. In this paper we are trying to study the methods of producing holographic images and using that concept in designing a holographic security system. In this research we shall also study about the use of laser and its use in producing the holographic images. For a better understanding of the concept of holography we need to understand interference and diffraction. We will try to explore more holography applications as once Elbert Einstein said- "If we knew what it was we were doing, it would not be called research, would it? " Therefore our main focus is that all the concepts are easy to understand from the perspective of beginners as well as the masters of this field.

1.Introduction

The concept of holography can be applied to many fields of science and technology .the holography technique is used in some applications such as holographic imaging, holograms, head up displays (HUD's) and much more. for that we need to understand some basic concept.

2.What Is Holography?

Holography is a technique of forming two dimensional and three-dimensional images by use of a laser involving the phenomenon of interference and diffraction of light. The image position, its orientation can be varied by the angle of interference and reflection of the laser beam thus forming a respective two-dimensional or three-dimensional image. Holography in other words can be termed as a lensless photography which involves the image formation by wave reconstruction.

A typical holographic imaging example is shown below
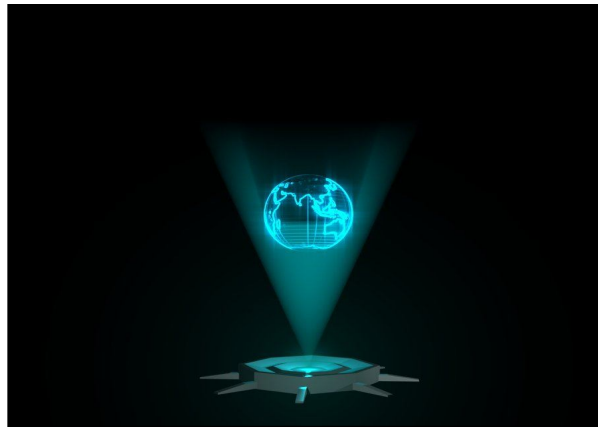
Figure 1

The above image shows the image formation using a holographic technology, where a globe like image is formed using laser.

3.Working With Holographic Security System

Here, comes the purpose of writing this research paper, here we will discuss about the security system which uses the technique of holography to design a security system which can prove to be useful for keeping confidential documents, keeping private information secure and secure the undesired access to the confidential information .

we are introducing the concept of holography in the locking system, where we can replace the latest LED, LCD screen displays by holographic displays. hence we can detect the passwords as well as the fingerprints of the person accessing the system. hence the advantage of using holographic display is it doesn't requires a specific space like acquired by other displays. And the technology improvement. fast, reliable and everyone cannot access such system easily.

Here ,we are introducing a holographic security system which would be using a holographic image technique, so a it will display a holography image showing the password input screen, where user can input a password and the sensor in the system will detect the password as well as the fingerprints of that person entering the password, thereby the system would match both the password as well as the fingerprints, this increases the security of the system, so in case if the password is been leaked or stolen but somehow system is still secured because of fingerprint detection technology. Image of such screen is shown below.

Figure: 2

Above shows a holographic image of a keyboard which is been reflected upon a wooden board, where the person can give a input and that input is been detected by the sensors.

4.How Security System Works

Holography is the technique that generally uses a light source to produce a light field scattered off objects can be recorded and later reconstructed when the original objects are no longer present. Thus, we require some apparatus such as laser, beam splitter, lenses, mirror, sensor and the photographic film. Thus the process is as follows, a coherent light source such as laser illuminates a coherent light beam that falls upon the beam splitter the beam splitter then splits the light waves into two identical beams thus one beam is reflected to the object whose image is to be formed and other is reflected by mirror directly on the photographic film, thus both the beam interfere with each other and that

pattern is imprinted on the recording medium thus a holographic image is formed ,moving on to the recording mechanism when the major work of input is done by sensor thus when authorized person interacts with the image it produces a destruction at particular point that point of destruction is recorded by the sensor in which bode the lock code and the passwords are recorded by it.

5.Use Of Holographic Security System

Such system could be installed in many systems such as laptops, mobile, locking system of a door, personal lockers and all such places which deal with confidential information. Such system could also be used by national bureau such as FBI, CBI, RAW, ISI and many more as these organization deals with all the private information and this security system could prove to be useful to be employed at such organizations.

6.Conclusion

The primary object of this research is to provide a security system with a input element that utilizes a real time angular invariant unique identification of a authorized user such as fingerprints or a coded password to open the lock of the security system

Further objective of the invention is to provide a holographic lock which inputs the particular fingerprints of authorized user that is stored in the form of hologram that is optically continuously compared with the predefine fingerprints. which authorizes unlocking of the device when the presented fingerprints correlated with the stored fingerprints. Thus this locking system proves to be useful to all the places where confidential documents have to be preserved as well as for laptops or computer system, which consist of the private information of data so as to preserve their confidentiality.

7.Reference

1. http://hyperphysics.phy-astr.gsu.edu/hbase/optmod/holog.html
2. http://en.wikipedia.org/wiki/File:Holography-reconstruct.svg
3. http://en.wikipedia.org/wiki/Holography
4. http://www.youtube.com/watch?v=iFp_Tzd11eQ
5. https://www.google.co.in/search?q=holographic+image&rlz=1C1GTPM_enIN528IN528&aq=f&um=1&ie=UTF-8&hl=en&tbm=isch&source=og&sa=N&tab=wi&ei=2zlcUamYNIuzrAfu-YCgAQ&biw=1600&bih=732&sei=3jlcUbaOD4GHrAf4poC4Dg